SPEC REU R Resources: Intro to R- Calculations & Logical Operations

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Walk Through Work

These guided exercises will walk us through the need-to-know R basics. We'll start with arithmetic and logical operations in R.

Arithmetic in `R`

You can use `R` as a calculator!

	Operator	Example
Addition	+	2+4
Subtraction	-	2-4
Multiplication	*	2*4
Division	/	4/2
Exponentiation	^	2^4
Square Root	sqrt()	sqrt(144)
Absolute Value	abs()	abs(-4)

```
4*9
```

```
## [1] 36
```

```
sqrt(144)
```

```
## [1] 12
```

```
4^5
```

```
## [1] 1024
```

```
4 ^ 5
```

```
## [1] 1024
```

Note that spaces between operators do not matter. So `4 + 5` is the same as `4+5`. We usually add spaces to make the code more legible. Note, however, that spaces do matter when defining character values. We will talk about character values in the next `R` lab.

Just like any regular calculator, you have to pay attention to the order of operations! Example:

```
6 * 8 - sqrt(7) + abs(-10) * (4/5)
```

```
## [1] 53.35425
```

```
6 * (8 - sqrt(7)) + abs(-10) * (4/5)
```

```
## [1] 40.12549
```

Logical operators

Arithmetic operations will yield a numerical output. (Correctly specified) logical operations yield one of two results: `TRUE` (or `T`) or `FALSE` (`F`). Logical operators are incredibly helpful for subsetting data, any type of exploratory analysis, data cleaning and/or visualization task.

	Operator
Less than	`<`
Less than or equal to	`<=`
Greater than	`>`
Greater than or equal to	`>=`
Exactly equal to	`==`
Not equal to	`!=`
Not `x`	`!x`
`x` or `y`	`x	y`
`x` and `y`	`x & y`
`%in%`	Testing whether a value is contained within a set.

Here are some simple examples:

```r
4 > 2
```

```
## [1] TRUE
```

```r
4 <= 2
```

```
## [1] FALSE
```

```r
5 == 2^2
```

```
## [1] FALSE
```

The examples above are very straightforward because we already know the result. The true value of logical operators lies in their ability to be applied across large amounts of data.

Let;s take a set (or collection of numbers)–in `R`, the technical term is a vector–and use logical operators on them.

```r
2 == c(2, 3, 4)
```

```
## [1]  TRUE FALSE FALSE
```

```r
2 %in% c(2, 3, 4)
```

```
## [1] TRUE
```

```r
5 %in% c(2, 3, 4)
```

```
## [1] FALSE
```

Exercise 1 What to you think is the output of the following operation?

```r
2 = 4
```

And the following?

```r
2 == 4
```